

LLC Research Programme Financed by the LLC Linnaeus Grant 2008-2010

Proposal from the LLC Research Committee to the LLC Board November 2007

Background

The Lund Laser Centre (LLC) was formed in 1995 as a joint entity between three faculties at the Lund University: the faculties of Engineering, Science and Medicine. With LLC as a base, an application to the EC within the Access to Large Scale Facilities programme was submitted. The application was successful, as were later corresponding applications, resulting in the status of the LLC as an EC Large Scale Infrastructure during all its time of existence. Yearly, 1.5 - 2 MSEK was thus available to the LLC for a Research Access programme. European groups, who submitted successfully evaluated proposals, have been coming to Lund to perform their projects together with LLC researchers. By retaining centrally about 0.5 MSEK of the funds received, it has been possible to have a secretariat and to perform small joint LLC activities.

The Swedish government decided in 2005 to open a new research funding programme for faculty support in competition between the Swedish universities. The support would be long-term – 10 years – a new feature on the Swedish research scene. The Swedish Research Council (VR) was selected to administer the new funding process in a programme, which was named *Linnaeus (Linné) Grants*. University rectors could apply with selected research programmes up to a certain financial volume, determined by the past total research budget. For Lund University a frame of 100 MSEK was allocated. LLC entered the internal competitive process and was successful to be selected for preparing a grant application at the level of 5 MSEK/y. The application

Exploring and Controlling the States of Matter with Light - Multidisciplinary Laser Spectroscopy within the Lund Laser Centre

was submitted with the following 10 LLC researchers listed as primary applicants (with CV and publication list):

Sune Svanberg, coordinator

Marcus Aldén

Sveneric Johansson

Jörgen Larsson

Anne L'Huillier

Mark Linne

Tönu Pullerits

Villy Sundström

Katarina Svanberg

Claes-Göran Wahlström

Lund University had previously decided to support each successful project with 1 MSEK/y from central funds.

The LLC application was successful, and on June 29, 2006, 5 MSEK/y was granted for 10 years, subject to certain regulations in an evaluation programme. Thus, in total 6 MSEK/y became available to the LLC to pursue LLC-coordinated activities.

In an extra LLC Board Meeting on August 23, 2006 it was decided to initiate the process of establishing an initial research programme by forming working groups, for which the following persons were selected as conveners/coordinators:

Sveneric Johansson
Anne L'Huillier
Marcus Aldén
Villy Sundström
Stefan Andersson-Engels
Claes-Göran Wahlström

At its regular LLC Board meeting, September 7, 2006, a Research Committee, put forward in the application, was appointed, consisting of 2 members external to the LLC and 5 internal members:

Prof. Ove Poulsen, Aarhus
Prof. Joseph Nordgren, Uppsala

Marcus Aldén
Stefan Andersson-Engels
Sveneric Johansson
Villy Sundström
Sune Svanberg

Sune Svanberg, selected by Lund University as the coordinator of the LLC Linnaeus grant, was appointed chairman of the Research committee. It was later proposed that Claes-Göran Wahlström, deputy director of LLC, be adjoined to the committee.

The Committee proposed a research programme to the LLC Board concerning the initial 18 months. The programme presented below was adopted by the Committee.

Allocations (and responsible person); 18 months (July 1, 2006 - Dec. 31, 2007)

Astrophysical/Atomic laser spectroscopy (Sveneric Johansson) Max. 1500 kkr

Advanced diagnostics applications in energy,
environmental and medical research (laser
spectroscopy and multi-spectral imaging) (Marcus Aldén) 1200 kkr

Real-time structural dynamics (Villy Sundström) 1200 kkr

Chemistry, physics and applications of sensitizers and beacons (Stefan Andersson-Engels) 1200 kkr

Lund High-Power Laser Facility:

}	Attosecond pulse generation, characterization and spectroscopy	(Anne L'Huillier)	1500 kkr
	Laser acceleration of particles	(Claes-Göran Wahlström)	(total)

Subsequently, it was decided to support a researcher position (Hampus Nilsson) at the Department of Astronomy for a period of 4 years at a level of 500 kkr/y within a total allocation to the Astrophysics/Atomic Physics activities of 800 kkr/y (instead of 1000 kkr/y). (Initially, it was decided to economically secure that one research position would be in place; this happened through an independent external grant. However, a somewhat reduced grant was still allocated to give the activities sufficient strength). Thus, the total cost for the research programme during 18 months was

6300 kkr

The Attosecond and Laser acceleration projects are both pursued at the Lund High Power Laser Facility. The two responsible persons were instructed to collaborate in using the allocated money in an optimum way.

It was further decided to allocate support for a possible adjoint professorship (limited to 3y) on 20% for Katarina Svanberg, Oncology Department. The cost amounts to about 200 kSEK/y. The grant could be financially integrated in one of the research projects proposed above (SAE), but has a commitment of 3 years.

Considering the first 18 months, further costs are support of the grant coordinator's salary with 100 kkr/y, share in the LLC administrative costs with 300 kkr/y, and support for advance courses and electronic services amounting to 100 kkr + 200 kkr. Most of these costs are effective only for the last 12 months (the LLC budget for the previous year was already covered from other sources). In total, this amounts to 700 kkr for the 18 months.

Thus, at the beginning of 2008 there will be an accumulated Linnaeus grant reserve of 9000 kkr – 6300 kkr – 700 kkr = 2000 kkr. It should be added, that there may be an accumulated additional reserve at the Linnaeus accounts for the different research projects at the different LLC divisions at the end of 2007.

The running research grant allocation is presently used for supporting 3 full-time graduate students, partial graduate-student- and post-doc support, partial support of professor's salaries, and support of electronics services and some joint teaching activity.

Proposed research programme for the coming 3 years, 2008-2010

The research programme has been discussed in two meetings with the local members of the LLC Research Committee, and a draft programme has subsequently been circulated among the members, and was later endorsed by the external members, Joseph Nordgren and Ove Poulsen (enclosure).

It was found that the initial research programme, organized within the 6 subgroups for the initial 18 months, has worked satisfactorily with momentum successively gained. Thus, it is proposed that the programme continues for the coming 3 years, based on the activities of these groups, where the research content is continuously developing.

In particular, it is proposed that the coordinator-ship of the Astrophysics/Atomic laser spectroscopy project is taken over by Hampus Nilsson, Dept. of Astronomy, following the official retirement of Sveneric Johansson. (At its meeting, September 25, 2007, the LLC Board decided that Hampus Nilsson be a regular member of the Research Committee, with Sveneric Johansson as an adjoined member.) Further, it is proposed that the research on particle acceleration with lasers, performed at the LLC 40 TW high-power laser system, will get support also during the coming 3 years, in view of the importance of the well-being of the largest installation offered within the LLC LASERLAB-EUROPE Access programme; placing the LLC among the few laboratories with a very special installation to offer (positioning the LLC strategically in the FP7 new application). As before, a joint allocation to the acceleration and the attosecond efforts is proposed with the task to the two coordinators to optimize the two activities at the Lund High-Power Laser Facility. The strategic collaboration with MAXLab was further noted.

The research programme in environmental monitoring and gas analysis, in a perspective beyond Sune Svanberg's upcoming retirement, January 31, 2010, was discussed. An assistant professor's position in the subject matter would be strategic, and for its financing different funding sources should be explored.

Financial needs differ at different groups and divisions. In order to pursue interdivisional collaboration, the financing of PhD student positions was considered to be an important element.

Budget, per year, 2008-2010 (not subject to 35% overhead)

(regarding the new professorship, the host division is supposed to be able to pay the university/department overhead and office/laboratory space costs from the faculty allocation, now enhanced by one professor's post)

Professor, Optical quantum electronics	1500 kkr
Electronics engineer support at LLC	300 kkr
Part in LLC Administration (includes Linnaeus management)	400 kkr
Course support	100 kkr
Total, annually	2300 kkr

The working groups are allocated yearly sums. The following costs include the overhead to be deducted according to individual division rules. The working group coordinators should consult with the Linnaeus grant coordinator regarding the implementation of the programmes.

<i>Collaboration</i>	<i>Coordinator</i>	<i>Allocation/y</i>
Astrophysical/Atomic laser spectroscopy (500 kkr earmarked for Hampus Nilsson's position)	Hampus Nilsson	800 kkr
Advanced diagnostics applications in energy, environmental and medical research (laser spectroscopy and multi-spectral imaging)	Marcus Aldén	800 kkr
Real-time structural dynamics	Villy Sundström	800 kkr
Chemistry, physics and applications of sensitizers and beacons, and related medical collaboration (20% adjoint professor's salary earmarked; ~200 kkr)	Stefan Andersson-Engels	800 kkr
<i>Lund High-Power Laser Facility:</i>		
{ Attosecond pulse generation, characterization and spectroscopy Laser acceleration of particles	Anne L'Huillier	1000 kkr (total)
	Claes-Göran Wahlström	
Sub-sum Projects		4200 kkr/y

In practice, this means, that the working groups continue their scientific work with the same yearly allocations as during the initial 18 months. The contents of the collaborations/projects is planned to develop dynamically during the coming 3 years.

Total budget **6500 kkr/y**

This means, that the Linnaeus strategic reserve, now 2000 kkr, would contribute 1500 kkr to the programme during the three-year period, leaving a reserve of 500 kkr. Since the professor in optical quantum electronics will most likely not be in place Jan. 1, 2008, the reserve might though increase. The strategic reserve would allow the LLC Board, through its Research Committee, to consider upcoming funding proposals within its activity field, or to increase the budget for the running projects.

For the LLC Research Committee

Sune Svanberg
Chairperson

November 14, 2007